AMENDMENTS TO THE CLAIMS

Please amend claims 1, 17, 24, 34, and 37, cancel claims 3-16, 18-23, 25-33, 36, and 38-48, and add new claims 49-62 as set forth in the listing of claims that follows.

1. **(Currently amended)** A $\underline{NO_X}$ ~~NOX~~ abatement system [[,]] comprising:

a $\underline{NO_X}$ ~~first NOX~~ adsorber disposed in-line, ~~capable of being disposed~~ downstream of, and in fluid communication with an engine; and

a selective catalytic reduction (SCR) catalyst adapted for storing ammonia disposed in-line, directly downstream of, and in direct fluid communication with said $\underline{NO_X}$ ~~the first NOX~~ adsorber ~~wherein the selective catalytic reduction catalyst is adapted for storing ammonia;~~

~~an off-line reformer disposed in selective communication with and upstream of the first NOX adsorber and the selective catalytic reduction catalyst, wherein the reformer is capable of producing a reformate comprising primarily hydrogen and carbon monoxide; and~~

~~a first oxidation catalyst and a particulate filter disposed in-line, upstream of and in fluid communication with the first NOX adsorber, and said particulate filter includes a water gas shift catalyst~~.

2-16. **(Canceled)**

17. **(Currently amended)** The system according to claim ~~of Claim 1~~, further including, ~~comprising:~~

an off-line burner disposed upstream of and in fluid communication with the reformer; and

an off-line reactor including an ammonia forming catalyst being in fluid communication with and disposed downstream of the reformer~~, wherein the reactor (44) comprises an ammonia forming catalyst~~.

18-23. **(Canceled)**

24. (**Currently amended**) A method of NO_X ~~NOX~~ abatement, comprising:

storing engine NOX from an exhaust stream in a NO_X ~~initial NOX~~ adsorber during a storage phase;

forming reformate including ~~comprising~~ primarily hydrogen and carbon monoxide in an off-line reformer during a regeneration phase;

reacting the reformate with the stored NO_X ~~NOX~~ to produce ~~greater than or equal to about 5,000 ppm~~ ammonia during the regeneration phase; and

storing the ammonia in a selective catalytic reduction (SCR) catalyst during the regeneration phase, said SCR catalyst being disposed in-line, directly downstream of, and in direct fluid communication with said NO_X adsorber.

25-33. (**Canceled**)

34. (**Currently amended**) A NO_X ~~NOX~~ abatement system, comprising:

an in-line selective catalytic reduction (SCR) catalyst adapted for storing ammonia ~~capable of~~ being disposed in fluid communication with an engine~~, wherein the selective catalytic reduction catalyst is adapted for storing ammonia~~;

an off-line reformer adapted to produce a reformate including primarily hydrogen and carbon monoxide, said reformer being in fluid communication with said SCR ~~the selective catalytic reduction~~ catalyst~~, wherein the reformer is capable of producing a reformate comprising primarily hydrogen and carbon monoxide~~; ~~and~~

an off-line reactor including an ammonia forming catalyst being in fluid communication with and downstream of the reformer~~, wherein the reactor comprises an ammonia forming catalyst~~; and

an off-line burner in fluid communication with and upstream of the reformer and the reactor.

35-36. (**Canceled**)

37. (**Currently amended**) A method of <u>NO_X</u> ~~NOX~~ abatement [[,]] comprising:

burning fuel off-line to form burner NOX<u>, wherein an off-line burner is upstream of and in fluid communication with a reformer and a reactor</u>;

forming a reformate <u>that includes</u> ~~comprising~~ primarily hydrogen and carbon monoxide <u>in the reformer</u>, off-line;

reacting the burner <u>NO_X</u> ~~NOX~~ with the reformate <u>in the reactor</u> to form ammonia, off-line;

storing the ammonia in an in-line selective catalytic reduction <u>(SCR)</u> catalyst;

introducing engine <u>NO_X</u> ~~NOX~~ to the <u>SCR</u> ~~selective catalytic reduction~~ catalyst; and

reacting the engine <u>NO_X</u> ~~NOX~~ with the ammonia.

38-48. (**Canceled**)

49. (**New**) The system according to claim 1, further including,

an off-line reformer adapted to produce a reformate having primarily hydrogen and carbon monoxide and disposed in selective communication with, and upstream from said NO_X adsorber and said SCR catalyst.

50. (**New**) The system according to claim 1, further including,

a particulate filter disposed in-line, directly upstream of, and in direct fluid communication with said NO_X adsorber; and

a first oxidation catalyst disposed in-line, directly upstream of, and in direct fluid communication with said particulate filter.

51. (**New**) The system according to claim 50, wherein said particulate filter includes a gas permeable ceramic material having a honeycomb structure.

52. (**New**) The system according to claim 1, further including,

a second oxidation catalyst disposed in-line, downstream of, and in direct fluid communication with said SCR catalyst.

53. (**New**) The system according to claim 52, wherein said second oxidation catalyst includes zeolite.

54. (**New**) The system according to claim 1, further including,

an off-line burner disposed upstream of and in fluid communication with the reformer; and

an off-line reactor including an ammonia forming catalyst being in fluid communication with and disposed downstream of the reformer.

55. (**New**) The system according to claim 1, wherein the NO_X adsorber includes a plurality of NOx adsorbers being disposed in a parallel arrangement to an exhaust flow direction through said SCR catalyst, said plurality of NO_X adsorbers being disposed in-line, directly upstream of, and in direct fluid communication with said SCR catalyst.

56. (**New**) The system according to claim 1, wherein the NO_X adsorber includes a first and a second NO_X adsorber, said first and said second NO_X adsorber being disposed inline and directly upstream from the SCR catalyst such that said first and said second NO_X adsorber are in direct fluid communication with the SCR catalyst, said second NO_X adsorber being disposed downstream of a by-pass valve such that when the exhaust stream is diverted around the first NO_X adsorber the exhaust stream passes through the second NO_X adsorber prior to entering the SCR catalyst.

57. (**New**) The system according to claim 1, wherein said NO_X adsorber includes a plurality of NO_X adsorbers and said SCR catalyst includes a plurality of SCR catalysts, and the plurality of SCR catalysts are disposed in-line and directly downstream of said plurality of NO_X adsorbers, said plurality of SCR catalysts being in direct fluid communication with said plurality of NO_X adsorbers, said plurality of SCR catalysts being adapted for storing ammonia.

58. (**New**) The method according to claim 24, wherein the step of reacting the reformate further includes,

reacting the reformate with the stored NO_X to produce greater than or equal to about 5,000 parts per million ammonia during the regeneration phase.

59. (**New**) The method according to claim 24, further including,

storing NO_X in a by-passed exhaust stream in a by-pass NO_X adsorber during the regeneration phase, and reacting the stored by-pass NO_X with the reformate during a storage phase of said NO_X adsorber, wherein the by-pass NO_X is disposed in-line, directly upstream of, and in direct fluid communication with said SCR catalyst.

60. (**New**) The method according to claim 24, wherein the NO_X adsorber includes a plurality of NO_X adsorbers being disposed in a parallel arrangement to an exhaust flow direction through the SCR catalyst, said plurality of NO_X adsorbers being disposed in-line and directly upstream of, and in direct fluid communication with said SCR catalyst.

61. (**New**) The method according to claim 24, wherein said NO_X adsorber includes a plurality of NO_X adsorbers and said SCR catalyst includes a plurality of SCR catalysts adapted for storing ammonia, and the plurality of SCR catalysts are disposed in-line and directly downstream from said plurality of NO_X adsorbers, said plurality of SCR catalysts being in direct fluid communication with said plurality of NO_X adsorbers.

62. (**New**) The system according to claim 34, further including,

an off-line mixing chamber disposed upstream of the reactor, downstream of and in fluid communication with the reformer, and in direct fluid communication with the burner.